Delegation to Works Committee
June 5, 2024

W. Bracken

DYEC 2023 Soil Monitoring Report

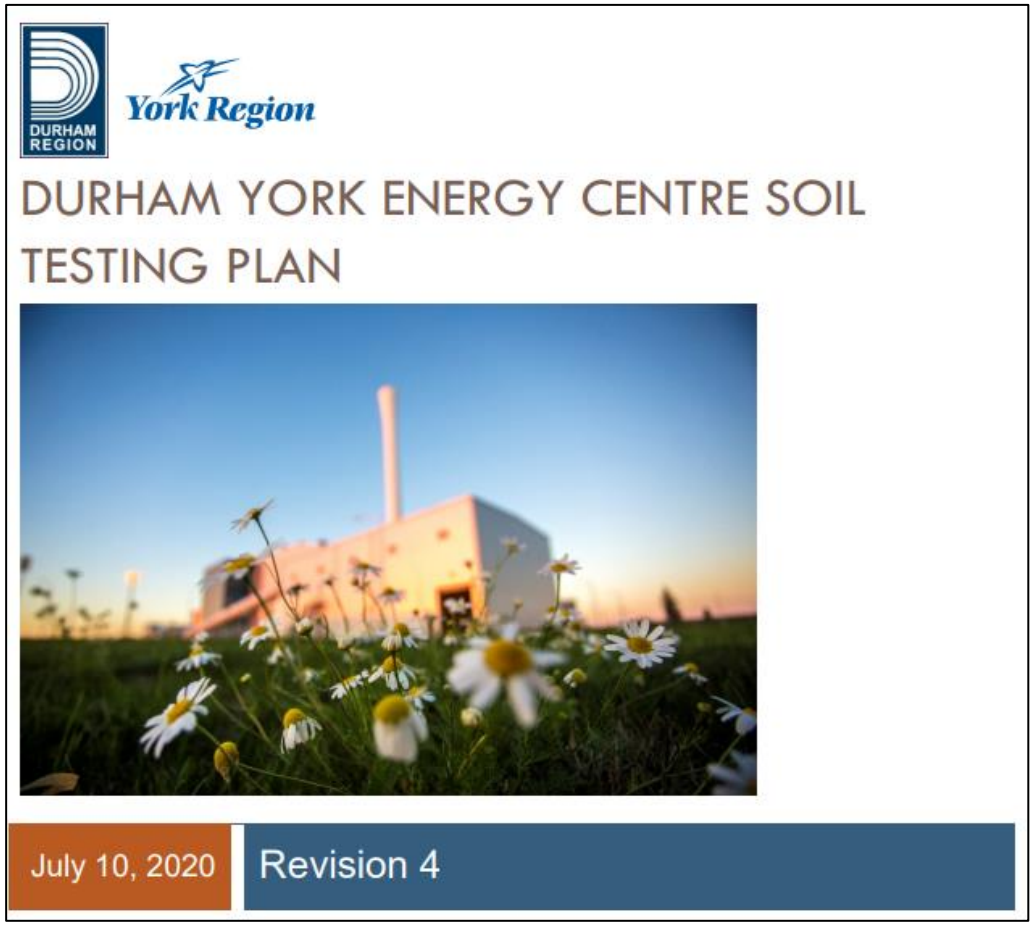
Soil and Other Environmental Loading Not Evaluated in ESR to Increase Throughput to 160,000 tonnes/year; 2023 Soil Results demonstrate

UPDATE REPORT NEEDED PRIOR TO ECA Application

- Last update to Regional Council was in 2019
- Many things have changed, new pertinent information is available
- MORE REPORTS SHOWING CONCERNS WITH THE DYEC have come forward
- UPDATE REPORT is needed PRIOR to ECA application
- Better health and environmental monitoring is being required in other jurisdictions
- Better and more comprehensive monitoring and pollution control technology is available, and Regional Council has HCA obligation to look at before ANY increase to throughput

The DYEC Soil Testing Plan

https://www.durhamyorkwaste.ca/en/environmental-monitoring/resources/Documents/Soil/Soil_Testing_Plan.pdf



The purpose of the soil testing plan is to:

a) Quantify background contaminant concentrations in the area

b) Monitor emission dispersion of EFW-related soil contaminants

c) Ensure ongoing environmental management of the site

d) Quantify any measurable concentrations resulting from emissions from the DYEC, including validating the predicted concentrations from the Human Health and Ecological Risk Assessment (HHERA) conducted during the 2009 Residual Waste Environmental Assessment (EA) Study, for predicted soil contaminant loading over the life of the facility

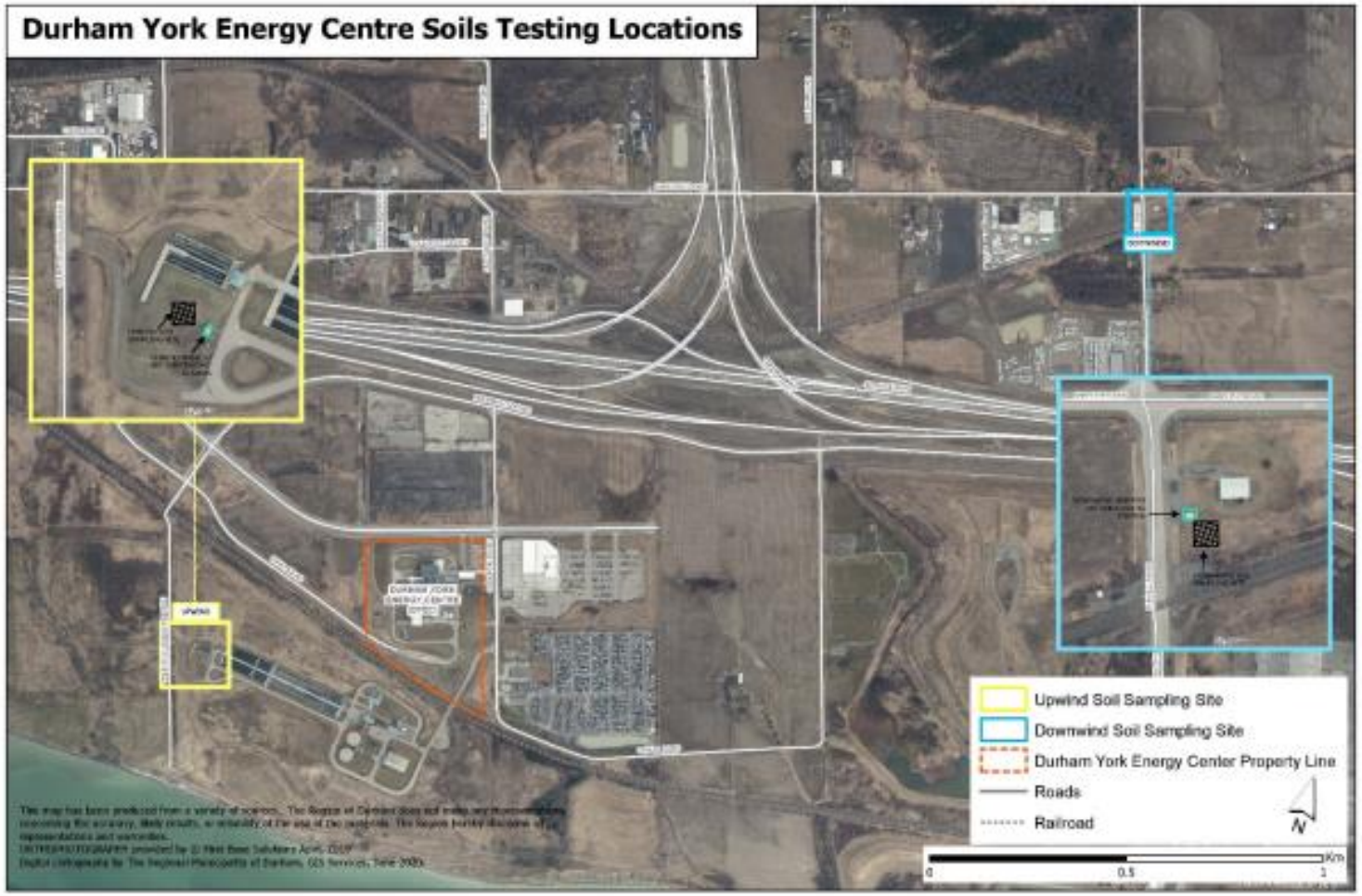
DYEC Soil Testing Plan
Sec. 2.2. Potential Sources of Impact

- “**Soil was one of the most important media considered in the HHERA (Human Health and Ecological Risk Assessment) due to emissions outfall from the DYEC**, the exposure pathway for human and ecological receptors and the natural environment, as well as the potential for chemical bioaccumulation over the life of the facility.”
- “**The primary source of deposition to soil are the facility emissions. The main source of emissions is the 87.6 metre tall main stack.**”

2023 Soil Testing Report: Samples Analyzed from Two Locations

https://www.durhamyorkwaste.ca/en/environmental-monitoring/resources/Documents/Soil/2023/20231115_RPT_DYEC_2023_Soils_Testing_ACC.pdf

Figure 2: Soil Testing Locations



Results from 2023 DYEC Soil Testing Report

"*Per Table 4*, ***concentrations of dioxins and furans in soil measured during the 2023 sampling event increased at both the upwind and downwind sampling locations relative to historical levels***"

The DYEC 2023 Soil Testing Report shows

2023 Downwind Concentrations More than Double 2013 Pre-DYEC Levels

That's a 114% Increase in Soil Concentration (Percent Loading).

	Background EA 2009[1]	Preconstruction Aug 2013[2]	Commissioning Aug 2015[2]	Operating* Aug 2016[2]	Operating Aug 2017[2]	Operating Aug 2020[2]	Operating Aug 2023[2]
Soil Concentration TEQ pg/g	1.2	1.12	0.7	0.626	1.22	1.23	2.4

1. Jacques Whitford, *Appendix B*, April 2009, *Site Specific Human Health and Ecological Risk Assessment (site specific HHERA)*, *Table 3.5 Baseline Concentrations for PCDD/PCDF in Soil*, page 41 of *Appendix B* (p. 91/196 pdf), Mean concentration (C_{mean}) of 13 samples taken from various locations was 1.2 TEQ ng/kg = 1.2 TEQ pg/g; Note baseline concentration used for input in HHERA was the 95% Upper Confidence Limit of the Mean (C_{UCLM}) =1.76 TEQ pg/g ~1.8 TEQ pg/g. https://www.durhamyorkwaste.ca/en/resources/Archived%20Documents/Appendix%20C-12%20Appendices/APPENDIX%20B%20-%20Baseline%20Chemical%20Concentrations_Dec09.pdf
2. RWDI, *Durham York Energy Centre 2023 Soil Testing Report*, November 15, 2023, *Table 4 Soil Analytical Results – Dioxins and Furans*, page 19/58 of pdf https://www.durhamyorkwaste.ca/en/environmental-monitoring/resources/Documents/Soil/2023/20231115_RPT_DYEC_2023_Soils_Testing_ACC.pdf

Measured Soil Concentrations AFTER 8 YEARS OF DYEC OPERATION are much higher than what HHERA **Predicted** for Soil AFTER 3O YEARS OF OPERATION

Excerpts Below are From the 2023 DYEC Soil Testing Report
https://www.durhamyorkwaste.ca/en/environmental-monitoring/resources/Documents/Soil/Soil_Testing_Plan.pdf

"***The HHERA concluded that after 30 years of operation***, *soil concentrations would increase less than 2% over baseline concentrations for all COPC except dioxins/furans and inorganic mercury*."

"*Soil concentrations of dioxins and furans were estimated to increase by 20% and 57% for the normal operation and process upset scenarios respectively*."

Unsupportable Statement in 2023 Soil Report

- "*Though 2023 soil results are noted as historical upper limits, the ambient air quality criteria was satisfied during recent air quality monitoring events, and source testing of dioxins and furans carried out in April 2023 indicated that the facility was operating well below the respective regulatory limits. Therefor the observed soil concentrations are not interpreted to be attributed to facility emissions*."
- Report also contains a lengthy section on limitations of the report. Includes the statement "*The conclusions and recommendations contained in this Soil Testing Report are based on … information: (1) supplied by the Client ….in relation to the Site at the time the Soil Test Report was prepared …. and (2) information made available by governmental authorities and other authoritative sources ("**THIRD PARTY INFORMATION**"). RWDI … does not accept responsibility for any deficiency, misstatement or inaccuracy contained in this Soil Testing Report as a result …*"
- Ambient air done only 1/24 days for dioxins/furans (~ 4% of operational time); further, the report refers to only "*recent air quality monitoring events*" yet the soil report covers 3 years of operation
- Report refers to April 2023 source test, but dioxins/furans source tests are only 12 hours duration which represents less than 0.2% of operating time under ideal conditions; d/f emissions vary over time, especially during other than normal operating conditions

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https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6224007/pdf/12302_2018_Article_166.pdf

Weber *et al. Environ Sci Eur* (2018) 30:42
https://doi.org/10.1186/s12302-018-0166-9

Environmental Sciences Europe

REVIEW Open Access

Reviewing the relevance of dioxin and PCB sources for food from animal origin and the need for their inventory, control and management

Roland Weber[1*], Christine Herold[1], Henner Hollert[2], Josef Kamphues[3], Markus Blepp[4] and Karlheinz Ballschmiter[5]

“For eggs/broiler, this can occur at a concentration of PCDD/Fs in soil below 5 ng PCDD/F-PDB-TEQ/kg dm. Egg consumers-especially young children-can easily exceed health-based guidance values.”

Abstract

Background: In the past, cases of PCDD/F and PCB contamination exceeding limits in food from animal origin (eggs, meat or milk) were mainly caused by industrially produced feed. But in the last decade, exceedances of EU limit values were discovered more frequently for PCDD/Fs or dioxin-like(dl)-PCBs from free range chicken, sheep, and beef, often in the absence of any known contamination source.

Results: The German Environment Agency initiated a project to elucidate the entry of PCBs and PCDD/Fs in food related to environmental contamination. This paper summarizes the most important findings. Food products from farm animals sensitive to dioxin/PCB exposure—suckling calves and laying hens housed outdoor—can exceed EU maximum levels at soil concentrations that have previously been considered as safe. Maximum permitted levels can already be exceeded in beef/veal when soil is contaminated around 5 ng PCB-TEQ/kg dry matter (dm). For eggs/broiler, this can occur at a concentration of PCDD/Fs in soil below 5 ng PCDD/F–PCB-TEQ/kg dm. Egg consumers—especially young children—can easily exceed health-based guidance values (TDI). The soil–chicken egg exposure pathway is probably the most sensitive route for human exposure to both dl-PCBs and PCDD/Fs from soil and needs to be considered for soil guidelines. The study also found that calves from suckler cow herds are most prone to the impacts of dl-PCB contamination due to the excretion/accumulation via milk. PCB (and PCDD/F) intake for free-range cattle stems from feed and soil. Daily dl-PCB intake for suckler cow herds must in average be less than 2 ng PCB-TEQ/day. This translates to a maximum concentration in grass of 0.2 ng PCB-TEQ/kg dm which is less than 1/6 of the current EU maximum permitted level. This review compiles sources for PCDD/Fs and PCBs relevant to environmental contamination in respect to food safety. It also includes considerations on assessment of emerging POPs.

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